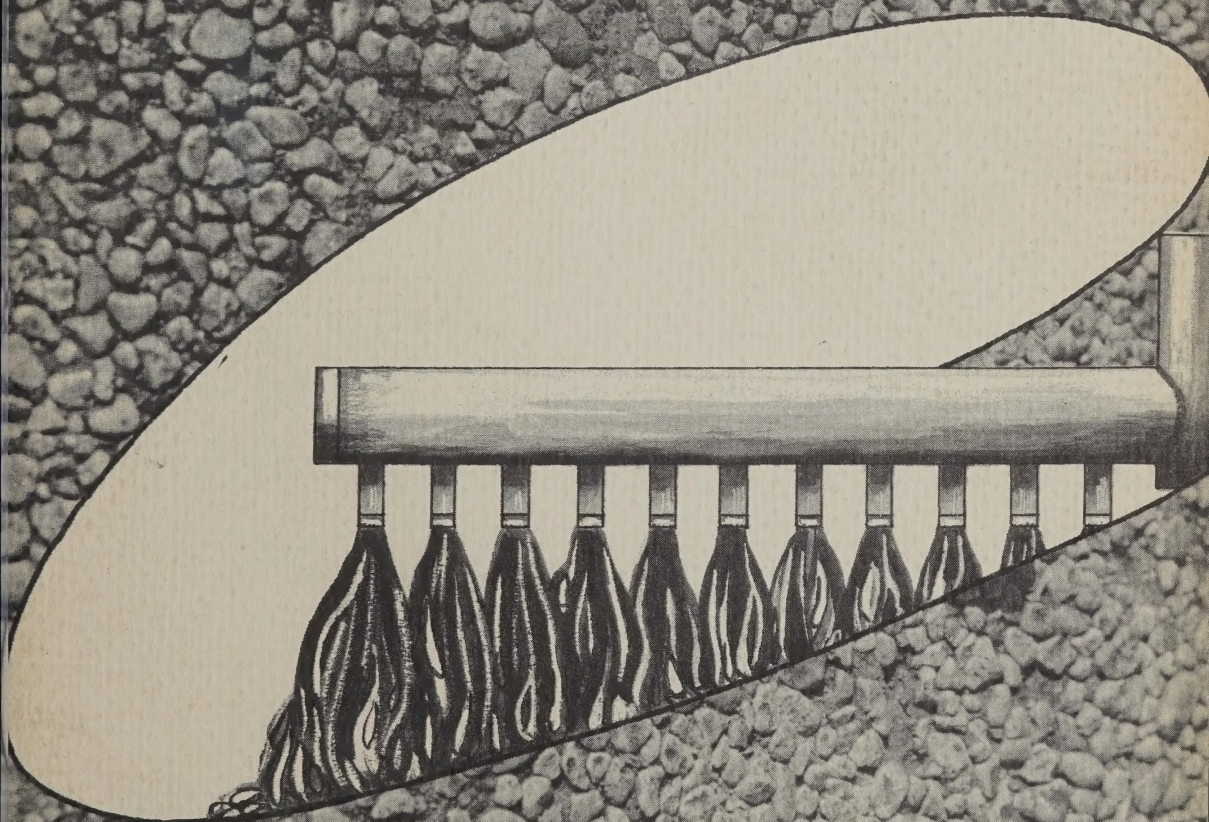
59.07

May, 1954

TEXAS Highways



DO YOU KNOW TEXAS?

Believed to have been built around 1749, this beautiful building was once the home of the Spanish governors or vice governors of the province of Texas.

Judicial tribunals, receptions, and gala balls were held here by the rulers of New Spain, and the bloody battles for Texas' independence swirled around its walls.

After Texas won her independence from Mexico and became a Republic, the adobe structure, which had been the Spanish Governor's Palace, slipped steadily downward. It became a secondhand clothing store, a restaurant, and a barroom called "The Hole in the Wall." When it was finally rescued from near oblivion by the City of San Antonio in 1929, it was junk filled, with only parts of the original building remaining.

Now completely restored, the Palace is one of the historic attractions in San Antonio. It contains many items of Spanish colonial furniture and wrought iron, and is surrounded by beautifully kept gardens just as it was in the days when Texas was a province of Spain.

About the Cover . . .

The common spray bar is one of the most "taken for granted" pieces of equipment used today. No one can say for sure who invented it or when and where it was first used. But everyone agrees it is of paramount importance in building and maintaining highways. It needs no introduction to motorists, in fact, it has grown to be somewhat of a landmark in the public's mind. There are many types as well as many uses of spray bars, ranging from the fancy species used for watering grass to the mongrel varieties used for shooting asphalt.

Regardless of name, whether store bought or shop built, it's still a spray bar and a very common but useful gadget to have around. In this issue, page 3, districts 7 and 8 introduce a new wrinkle on "Diluted Emulsion Seals," where the spray bar comes in handy.

VOL. I

TABLE OF CONTENTS

NO. 7

Diluted Emulsion Seals 3
J. C. Roberts and T. J. Kelly

Texas Expressways Booklet 8

Wheel for Dragoff Blade 9
R. N. Jennings

Commendation 11

Center Parking on U.S. 281 15
J. F. Snyder

Emulsified Asphalt for Pilot Lines 17
Hubert Fields

Keep 'Em Numbered — One Operation 19
C. J. Pilant

Construction of District 25 Warehouse 22
Palmer Massey

They Like It 24
W. W. Potter

New Equipment Rental System 25
E. D. Parmer

Arithmetic 36
E. D. Parmer

Highway Signs Go to School 37
J. F. Snyder

Personnel Changes 41
H. L. Arno

Accidents Reported for March 42
Equipment and Procurement Division

Over the Highways 43
Comments From the Traveling Public

TEXAS Highways

The purpose of this publication, "Texas Highways," is to furnish a medium for presenting practical ideas and information. Employees are invited and urged to submit suggestions and relate experiences which would benefit or be of interest to Highway employees. These conclusions and data are not necessarily endorsed by the Highway Department nor are they to be construed as instructions.

Photographic services are available and other assistance may be obtained, if desired, in preparing material for submission. All material and comments should be directed to the Information and Statistics Division, Austin 14, Texas.

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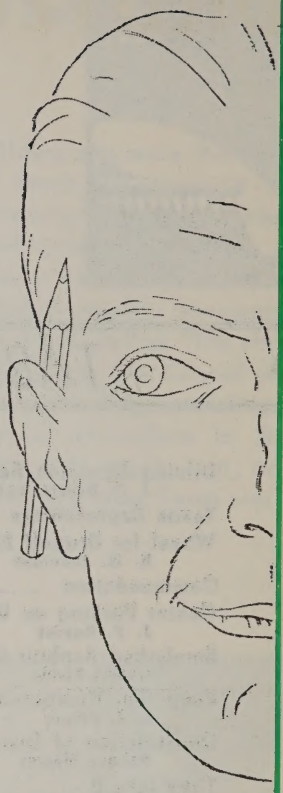
COMPILED AND EDITED
Information and Statistics Division

BY BERTON BRALEY

THE INDISPENSABLE YOU



PUBLIC RELATIONS is not just the art of
Putting a message across;
Public Relations is something you're part of
Either for profit or loss,
You, in your job, are the firm's emissary,
All that you say and you do
Counts—plus or minus—with Tom, Dick and Harry,
Public Relations is—YOU!

MILLIONS that go into winning the people's
Confidence, friendship, good will,
You can knock higher than several steeples
If you're a grouch and a pill.
You put the blessing, or you put the curse on all
Planning and policy too,
Public Relations is private and personal,
Public Relations is YOU!

IT IS BY YOU that the customer judges
You give the Public its slant,
You're the promoter of grins or of grudges,
It's the impression you plant
That'll decide if your firm's reputation's
Proved by performance, all through;
Public Relations is private relations,
Public Relations is YOU!

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DILUTED EMULSION SEALS

Many of us have wished for some easy way of adding a little asphalt to improve or prevent deterioration of an existing pavement. Of proven value in maintaining finished flexible bases prior to application of the surface, diluted emulsion seals have recently been applied on pavements by the San Angelo and Abilene Districts and are being observed to determine their merit in prevention of aggregate stripping and possibly in sealing of hair cracks. As indicated by reports from both these Districts, this treatment could be the solution for some of our problems.

DISTRICT 8

J.C. Roberts, District Engineer

In the summer of 1952, we borrowed an idea from the Maintenance Department of the City of Austin which involves the use of a mixture of HVMS emulsion and water applied to dusty streets as a dust palative. This procedure was brought to our attention by B. B. Freeborough, formerly of File D-14 in Austin.

Our first experience was in Jones County on F. M. 1233. We applied a mixture of emulsion and water on the raw base under traffic. This proved to be an excellent substitute for the usual MC-1 prime which we have used in the past. Since this experimental job, we have eliminated the use of MC-1 as a prime on bases and have provided for the water and emulsion treatment to all new bases in the district.

Our experience with the mixture of water and emulsion on bases in lieu of the MC-1 prime indicated to us that the same treatment might be applicable to old surfaces which have shown a tendency to ravel and hair crack. Of course, the raveling condition and the hair cracking condition can be caused by a lack of asphalt in the initial application or a lack of traffic on the surface to make the asphalt react properly during the summer weather. The idea of applying emulsion and water mixture on the existing surfaces was tried first on F. M. 618 in Haskell County in September, 1953. This pavement showed every indication that we misjudged its condition previously and that it needed to be sealed immediately. A total application of approximately .06 of a gallon of residual asphalt was applied on this surface in one application of the water and emulsion mixture. This amount appeared to be too heavy for one application and by increasing the speed of the trucks, we found that it was an improvement for each pass with the water trucks to leave approximately .02 of a gallon of residual asphalt per square yard. Of course, as many applications may be made as field conditions deem necessary. The visual results of this treatment were to us most gratifying. Beyond a doubt the raveling of the aggregate was immediately stopped and there is no doubt that the hair cracks in the pavement were filled with the residual asphalt.

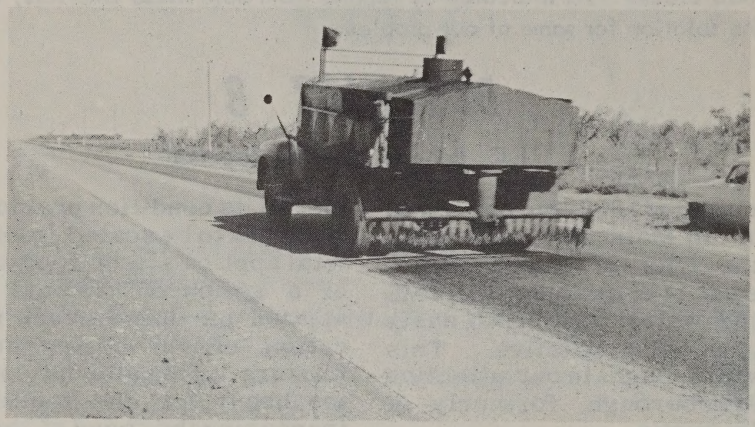
It is my opinion that this type of treatment applied as often as necessary on any road on which there is no danger of causing a slick surface can delay the need of a seal coat indefinitely. Because of the very small quantity of residual asphalt used in this work, it is our opinion that the danger of causing a slick surface is very, very slight on the roads we have treated. Our experience shows that 15 per cent mixture of emulsion and water gives the results we desire.

The equipment used on work of this kind consists of 1,000-gallon water

tanks with three-inch round spray bars eight feet long. The openings in the spray bars are one-half inch on eight-inch centers. Attached to the spray bars are one and one-half inch by one and one-half inch flat irons about one-half inch under the openings, which are used as "splatter boards" to more evenly spread the mixture during the application.

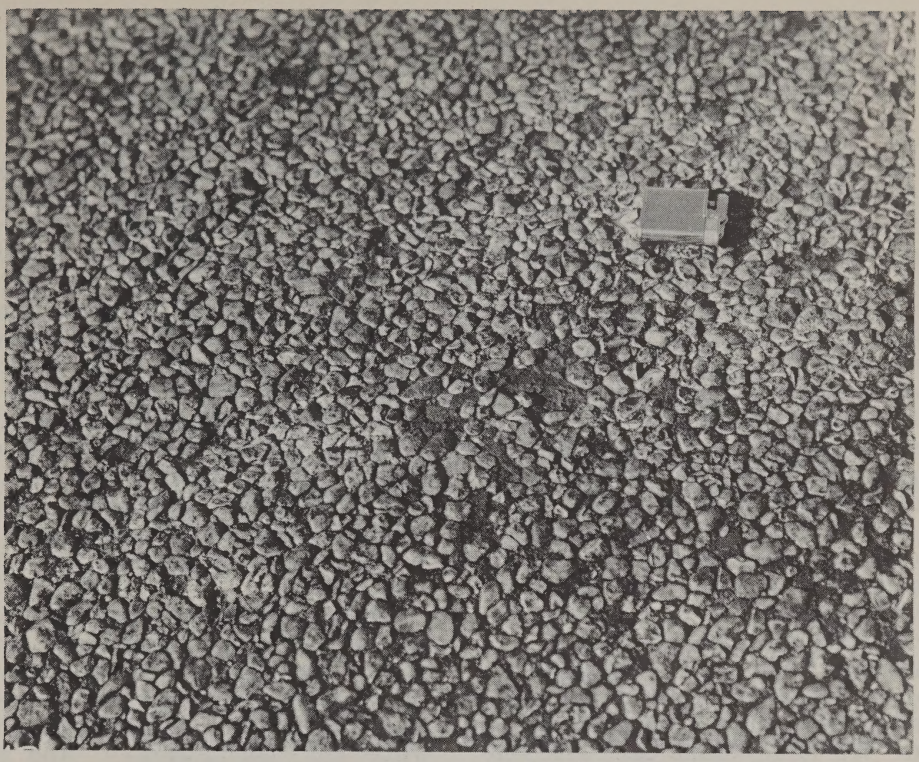
Since the early fall we have treated approximately 90 miles of single asphalt surface in the district in this manner. In each case the single asphalt surface consists of .4 of a gallon of OA 135 and a Grade 3 cover stone.

The cost of work of this type is variable and depends largely upon the distance that water must be hauled. Our records indicate that the average cost per single application varies from $30 to $40 a mile. We have found that in some cases as many as four applications are needed to secure the desired results.



Water tank and distribution of emulsion water.

Texture of pavement after water emulsion application.



Close-up of texture of pavement after application of weak emulsion.

Hair cracks which are filled with emulsion after application.

DISTRICT 7

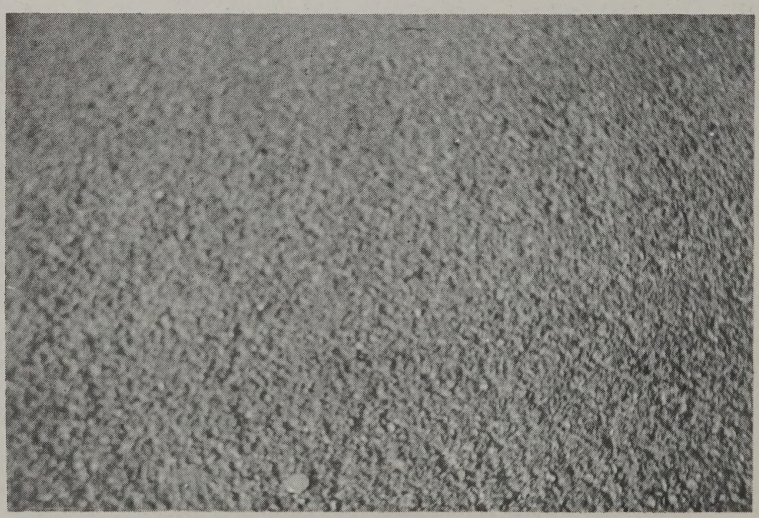
T. J. Kelly, District Engineer

Most emulsified asphalts can be readily diluted with water. This quality permits wide variation in the amount of dilution, allowing uniform application of very thin films of asphalt. This characteristic, which is peculiar to emulsified asphalt, has many evident usages. However, this discussion is being confined to its use for the rejuvenation of existing dry asphalt surfaces without resorting to the greater expense of customary "seals" for the same purpose.

In this district it is usual practice to place the emulsion in an ordinary water truck, then to add the water, depending upon the addition of the water and the motion of the truck to do the mixing. The sprinkler bars are equipped with larger holes and splatter plates to obtain more uniform distribution. We have found that with our sprinkler trucks, equipped with eight-foot spray bars, driving about twelve miles per hour, and using a mixture of 10 per cent emulsified asphalt, approximately .02 gallon of asphalt is applied per square yard.

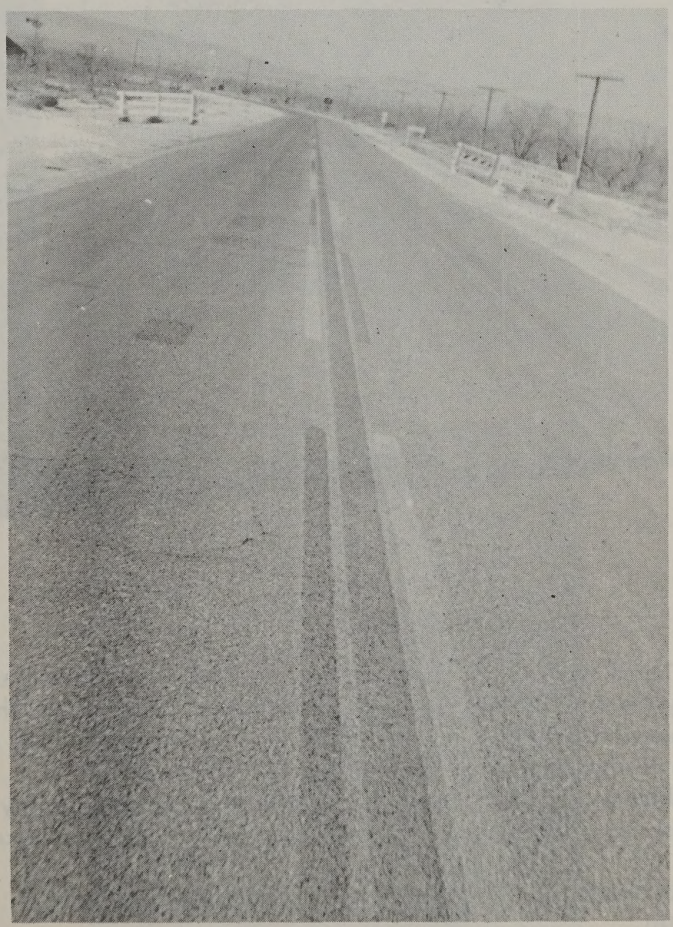
Using a mixture of 15 per cent emulsified asphalt, we obtain approximately .03 gallon of asphalt per square yard. Of course it is necessary to vary the speed as the tank empties to insure uniformity in application. It is of prime importance in this method that each application be a thin film, regardless of the accumulative total to be applied. It is desirable that each application be allowed to break and cure completely before succeeding applications are made. In any event, traffic should be kept off the treated surface until there is no longer danger of the asphalt film being picked up. This will be probably 30 minutes to one hour. Applying the mixture in half widths is very helpful in providing for traffic.

This method was first used experimentally in this district in the summer of 1952 on a penetration-type surface which was showing some tendency to ravel in spots. The results obtained were very satisfactory, and the use of the method was increased. It has been observed that the thin asphalt film is soon worn off the top of the exposed aggregate, and thus the original color of the pavement is restored within a month or so. The size of areas to be treated can be varied as desired, as the mixture can be applied with an ordinary sprinkling can.



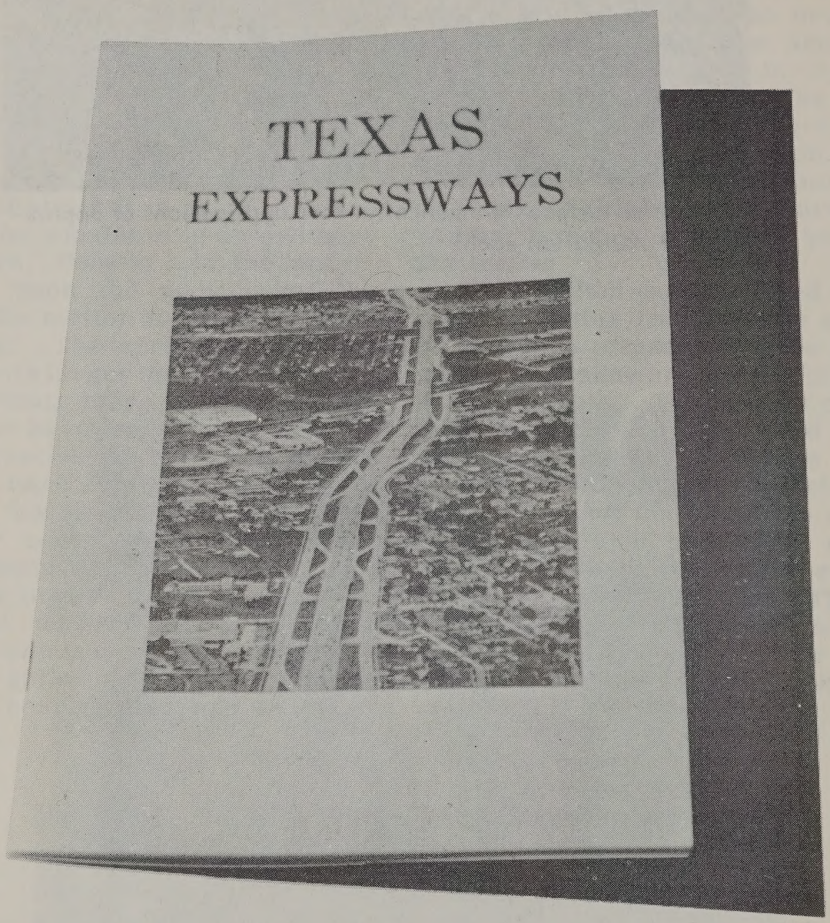
Road mix surface after one application of approximately .02 gallon.

Penetration surface treatment after four applications of approximately .02 gallon each.



Road mix surface after five applications of approximately .02 gallon each.

TEXAS EXPRESSWAYS BOOKLET



A new Texas Highway Department booklet, "Texas Expressways," has just been published by the Road Design Division. Designed to better inform the layman of the needs for expressways, the new pamphlet is being printed in large numbers for free distribution to anyone interested.

The booklet explains in simple terms the effects of expressway construction on communities, how frontage roads operate, and what controlled access is and how it works.

Copies for distribution may be obtained from the Information and Statistics Division in Austin.

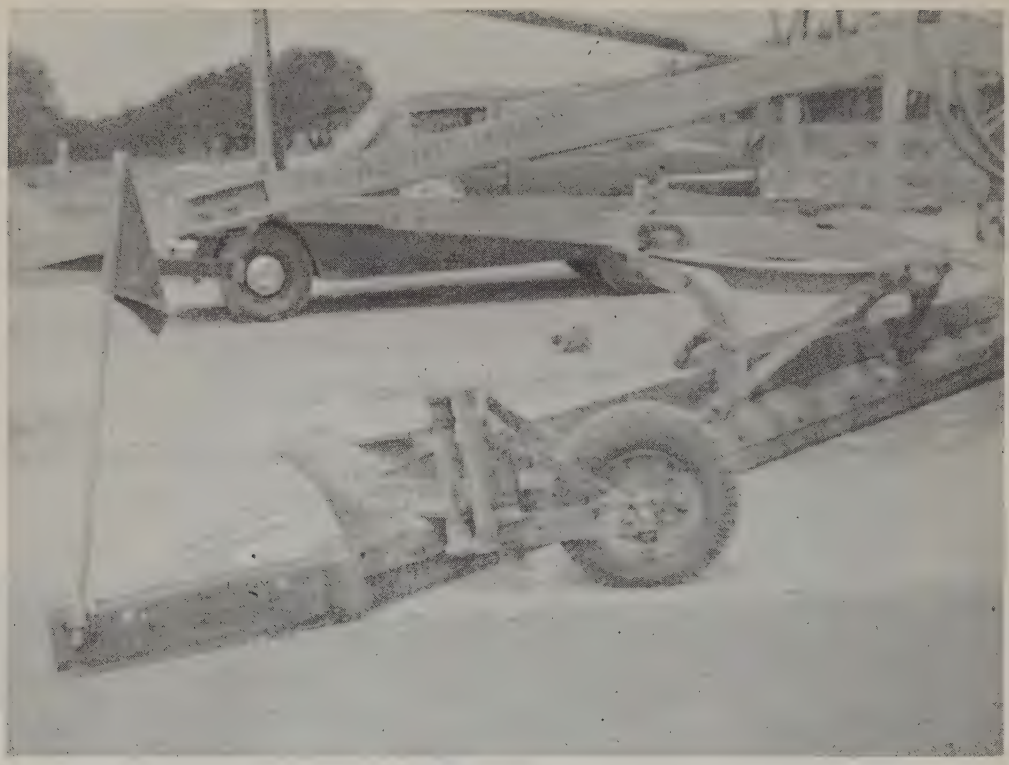
WHEEL for Dragoff Blade

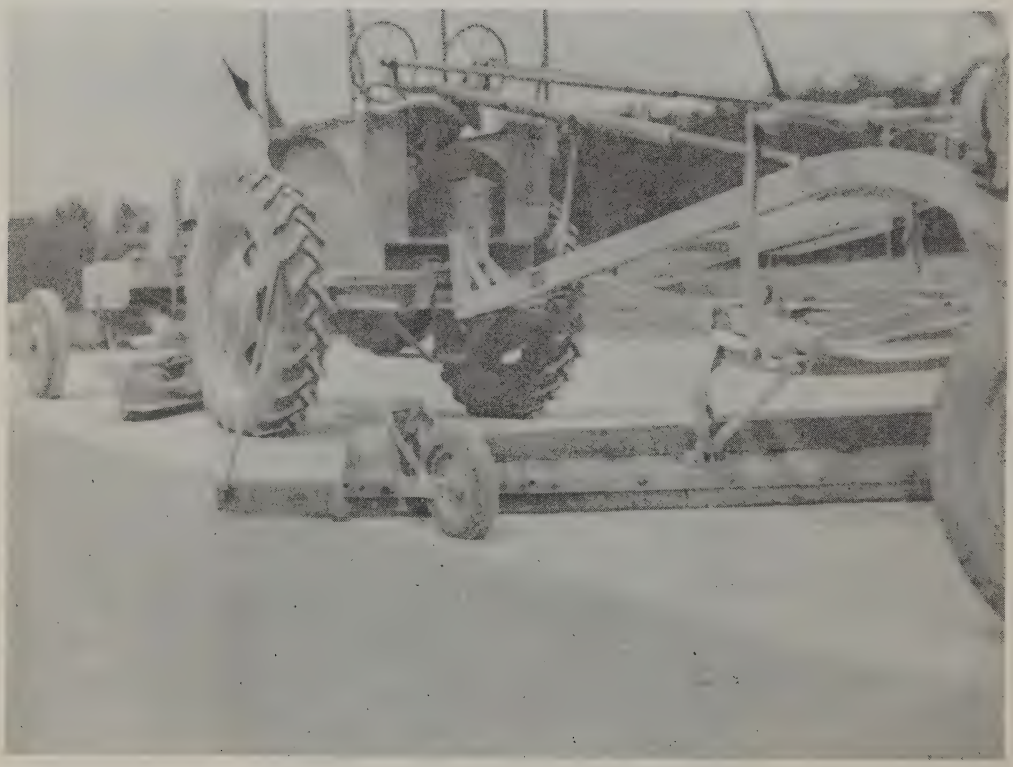
R.N. Jennings, District Maintenance Engineer
District 7

District 7 uses small maintainers with tail blades for maintaining its shoulders. The wear on blades next to the edge of the pavement was high, and frequent replacement was necessary to enable a good clean-off job to be done.

A. M. Burrier and M. Hunsucker, skilled laborers of the Junction section, devised an adjustable wheel arrangement on the moldboard to take the weight of the equipment. This has greatly reduced wear on the blades.

The extension of the blade shown in photographs prevents any material from tailing out around the forward edge of the drag.





Commendation...

TEXAS GOOD ROADS ASSOCIATION

THE TEXAS GOOD ROADS ASSOCIATION IS A VOLUNTARY, NON-PROFIT, NON-POLITICAL, STATEWIDE ORGANIZATION DEDICATED TO THE PRESERVATION OF HIGHWAY USER TAX REVENUES FOR THE CONSTRUCTION AND MAINTENANCE OF A WELL PLANNED AND ADEQUATE ROAD SYSTEM FOR TEXAS

Drawer G, Capitol Station — Austin, Texas

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Executive Vice President

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FRED A. WEMPLE, Midland

TEXAS PARADE
Official Publication

March 29, 1954

Mr. Dewitt C. Greer
State Highway Engineer
Highway Building
Austin, Texas

My dear Dewitt:

I am enclosing an official copy of a resolution of commendation as passed by the members, officers and directors of the Texas Good Roads Association at the annual meeting in Austin on February 26, 1954.

This resolution was unanimously adopted and represents to the strongest degree the high esteem in which the Highway Commission and Department are held by those of us who know the fine work you are doing.

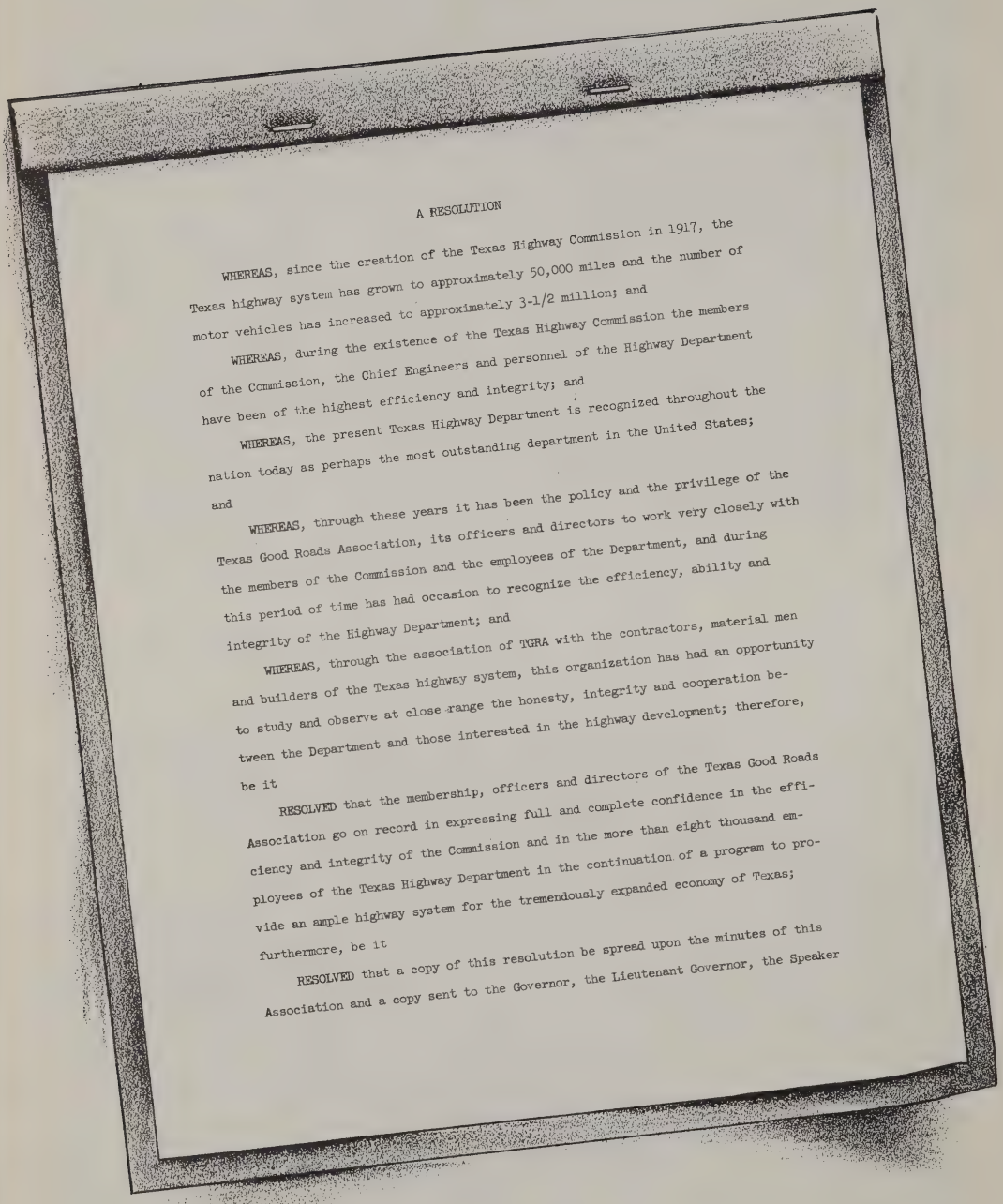
I am sending the original copy to you for the permanent files of the Highway Department and we are mailing a copy of this resolution to each of the members of the Commission, the Governor, Lieutenant Governor, and the Speaker of the House as directed in the resolution.

Please be assured this was our happy privilege.

Cordially yours,

Ike Ashburn

cc: Gov. Allan Shivers
Lt. Gov. Ben Ramsey
Hon. Reuben E. Senterfitt
Hon. E. H. Thornton, Jr.
Hon. Marshall Formby
Hon. R. J. Potts



A RESOLUTION

WHEREAS, since the creation of the Texas Highway Commission in 1917, the Texas highway system has grown to approximately 50,000 miles and the number of motor vehicles has increased to approximately 3-1/2 million; and

WHEREAS, during the existence of the Texas Highway Commission the members of the Commission, the Chief Engineers and personnel of the Highway Department have been of the highest efficiency and integrity; and

WHEREAS, the present Texas Highway Department is recognized throughout the nation today as perhaps the most outstanding department in the United States; and

WHEREAS, through these years it has been the policy and the privilege of the Texas Good Roads Association, its officers and directors to work very closely with the members of the Commission and the employees of the Department, and during this period of time has had occasion to recognize the efficiency, ability and integrity of the Highway Department; and

WHEREAS, through the association of TGRA with the contractors, material men and builders of the Texas highway system, this organization has had an opportunity to study and observe at close range the honesty, integrity and cooperation between the Department and those interested in the highway development; therefore, be it

RESOLVED that the membership, officers and directors of the Texas Good Roads Association go on record in expressing full and complete confidence in the efficiency and integrity of the Commission and in the more than eight thousand employees of the Texas Highway Department in the continuation of a program to provide an ample highway system for the tremendously expanded economy of Texas; furthermore, be it

RESOLVED that a copy of this resolution be spread upon the minutes of this Association and a copy sent to the Governor, the Lieutenant Governor, the Speaker

of the House of Representatives, each member of the Texas Highway Commission and to the Chief Highway Engineer expressing this appreciation and offering the continued cooperation of this organization to perpetuate this fine and honorable record.

The above resolution was unanimously adopted by the officers and members of the Texas Good Roads Association at its annual meeting in Austin on February 26, 1954.

Ike Ashburn
Executive Vice President

ATTEST:

L. A. Wilke

TEXAS GOOD ROADS ASSOCIATION

COMMISSION

E. H. THORNTON, JR., CHAIRMAN
ROBT. J. POTTS
MARSHALL FORMBY

TEXAS HIGHWAY DEPARTMENT

AUSTIN 14, TEXAS

STATE HIGHWAY ENGINEER
D. C. GREER

March 31, 1954

IN REPLY REFER TO
FILE NO. DCG

General Ike Ashburn
Executive Vice President
Texas Good Roads Association
Austin, Texas

Dear General:

On behalf of the Highway Commission, all of the Highway Department employees, and myself, I wish to thank you for the splendid resolution of commendation passed by the Texas Good Roads Association.

We are all human and consequently when words of approbation such as yours are received, it makes us very grateful and proud indeed.

Again let me express the gratitude of the entire Highway Department for your expression of confidence.

Sincerely,

D.C. Greer

D.C. Greer
State Highway Engineer

Center Parking on U.S. 281

J.F. Snyder, District Engineer
District 21

The parking problem on U.S. 281 in Pharr on South Cage Boulevard has been a trouble spot for many years, and all efforts by this office to eliminate center parking have failed. At the last of our numerous discussions with the City and Chamber of Commerce in regard to this center parking, we reached a compromise that appeared to be of some benefit, particularly from the safety angle, whereby we would change the angle parking in the center to parallel parking.

West Park Avenue.

Center angle parking on East Park Avenue, which is the same width as Cage Boulevard (U.S. 281).

Parallel center parking on Cage Boulevard (U.S. 281) in Pharr.

Note median arrangement.

Parallel center parking.

To make this possible and keep it under control, we provided a median down the center of the street slightly offset to where a car, when parked parallel, would be exactly in the middle of the street. Small islands at each intersection were constructed to provide a limit to the parking area and, also, to allow some sight distance at the intersection.

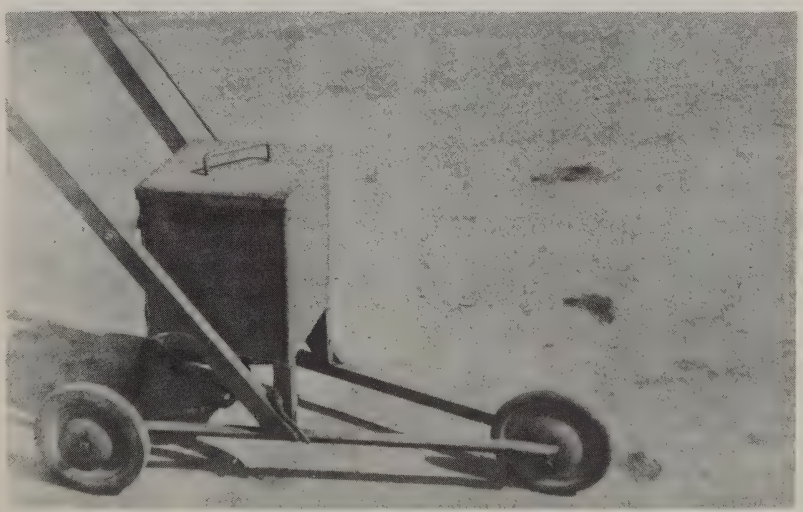
We will admit that this is not a satisfactory solution to our problem, but it certainly was a great improvement over the existing situation and, we feel, the first step toward completely eliminating the center parking.

Emulsified Asphalt for Pilot Lines

Hubert Fields, Senior Maintenance Foreman
District 7

For the past few years in District 7 we have been using a pilot line as a guide for placing the raised asphaltic center stripe. As soon as a road is sealed, or new construction is assumed for maintenance, we apply the pilot line. This line then provides a visible center line until the center stripe is placed.

For our pilot line work, we have been using standard yellow traffic paint, YP 7, and using five or more gallons per mile. This paint costs $2.39 per gallon. The thinner used to cut the paint to make it workable has some fluxing effect on an asphalt surface. This causes some darkening of the yellow stripe, which is objectionable in the narrow pilot line. Because of the high cost of the paint and the darkening effect of the solvent, it was decided to try emulsified asphalt (EA-HVMS 350) for the pilot line work. This has been done, and results so far have been very satisfactory. The daylight visibility of an emulsion stripe is much better than one of yellow paint, and at night, when yellow paint lines are hardly visible, the emulsion pilot line shows up quite well.



Pilot line machine - Rubber tire not removed from front wheel, but shop grooved.

Asphalt emulsion pilot line on straightway.

Asphalt emulsion pilot line on curve.

Forty to fifty per cent water was used to cut the emulsion. This depends on how much emulsion is stored and from what part of the storage tank the emulsion is taken. We have found that the emulsion is not uniform throughout storage tanks.

The water and emulsion are thoroughly mixed and poured through a strainer into the container on the pilot line machine. Enough water is used to cut the emulsified asphalt back so that the mixture will break and dry in approximately the same length of time as the YP 7 paint. On hot, clear days the mixture will break somewhat faster The emulsion pilot line is also reasonably effective on a black surface, such as road mix or hot mix, despite its black color.

- Comparative costs per mile -	
Yellow Paint - 5 gal. @ $2.39	$11.95
Emulsion - 5 gal. @ 0.11	0.55
Saving per mile	$11.40

A crew of four to six men will apply approximately five to six miles per day, depending on the amount of curves, traffic conditions, and other interference.

"KEEP 'EM NUMBERED - ONE OPERATION"

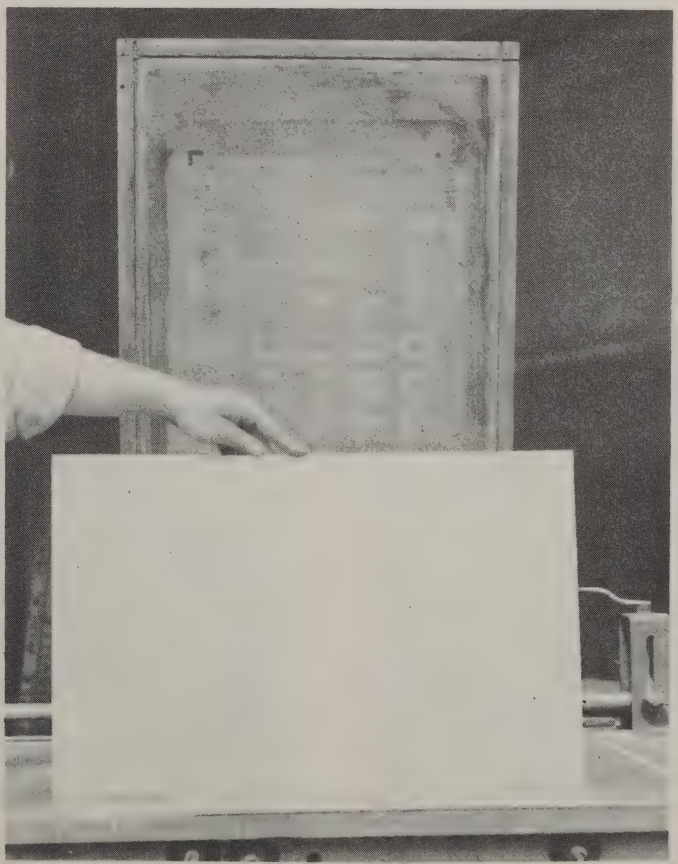
C.J. Pilant, Construction Foreman
District 19

We have eliminated the necessity of renumbering mileposts each time the posts are repainted. This is done by attaching a metal plate with reflectorized sheeting that bears a stencil number over the sheeting. Our procedure is simple and easy to follow.

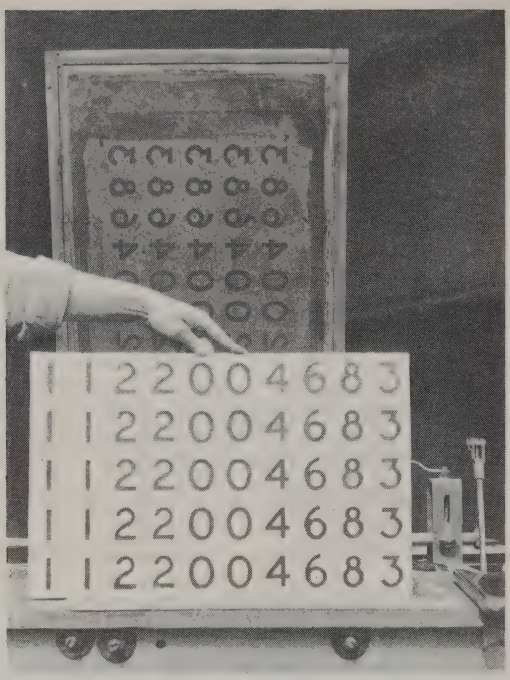
The pictures show various stages of construction of these reflectorized metal plates in our Sign Shop. The metal base consists of 26-guage galvanized sheet iron. The two-inch letters used in numbering the milepost are stenciled on a 15 by 24-inch sheet. This size block will allow 50 numerals per sheet.

In repainting, we merely paint around the plate. If it is necessary to replace the post these small plates can be removed and attached to the new post. This installation shows no reflector buttons since the reflectorized material on this plate eliminates the need of reflector buttons. We estimate the cost of these plates to be approximately 4 cents each constructed in the Shop in comparison with the cost of the reflector buttons which are in excess of 10 cents.

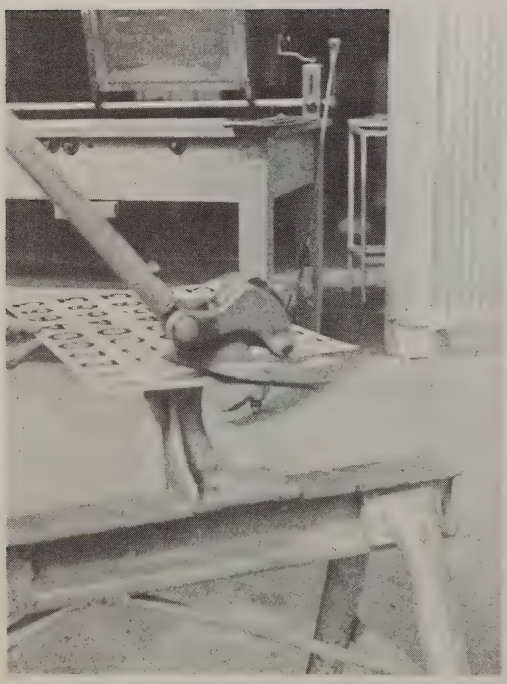
The small reflectorized plate will simplify the numbering and reflectorizing of our mileposts as it allows the Sign Crew to erect, paint, and number a post in one complete operation.



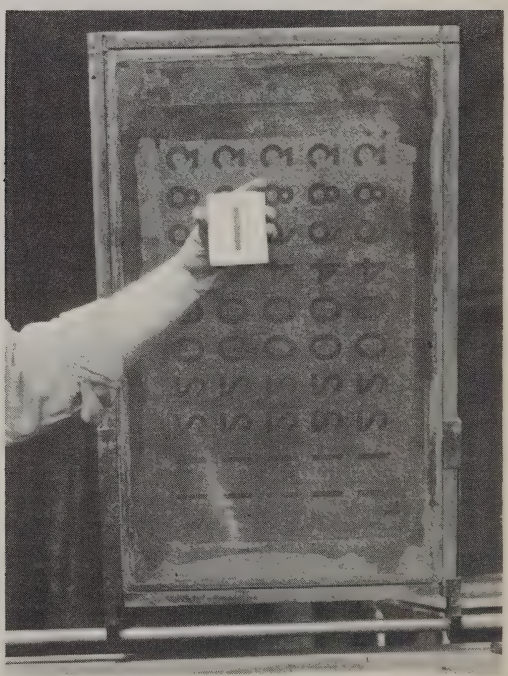
Galvanized sheet metal with reflectorized sheeting applied. In the background is the silk screen used.



Sheet metal after application of the numerals.



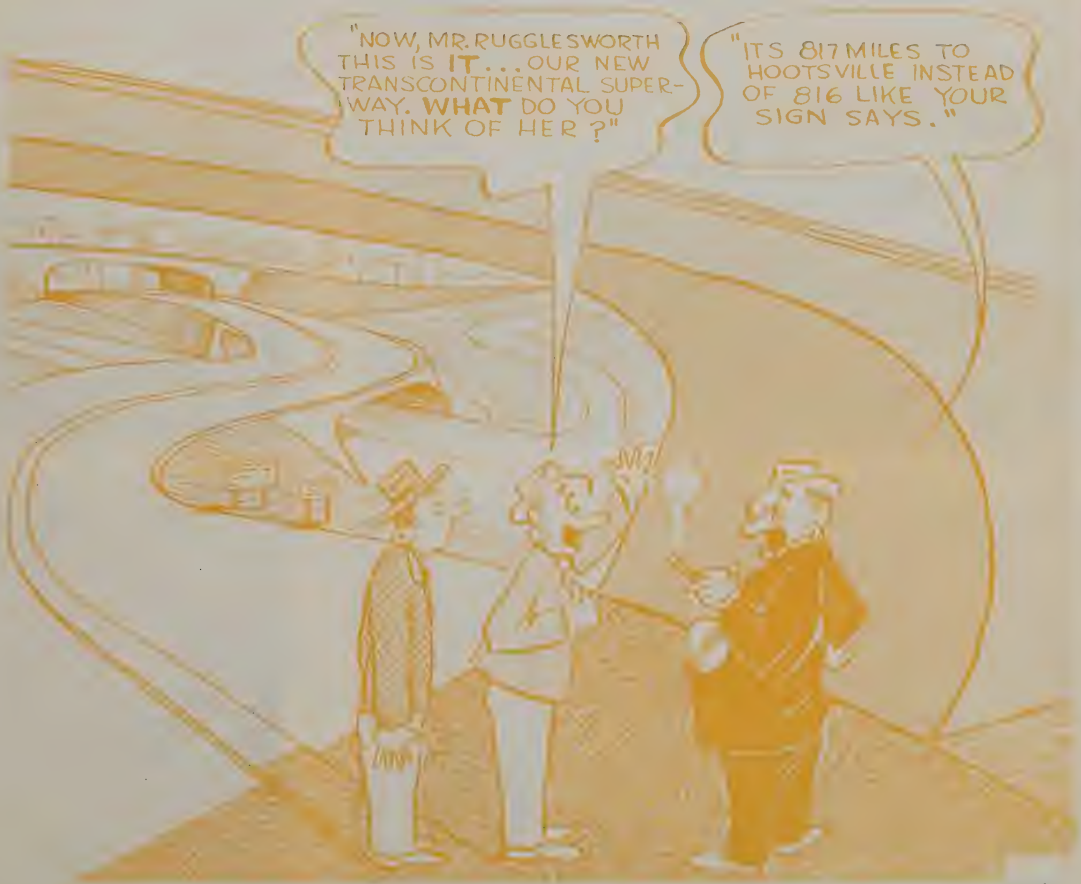
Cutting the larger plate into individual numbers by use of Beverly Throatless Cutting Shears.



Individual number on a metal plate approximately two and one-half by three inches.

Individual plates attached to the milepost in the field. Four galvanized shingle nails are used to attach these plates. (The number eight milepost happened to coincide in this instance with the number of our State Highway 8 marker shown in these prints.)

● ● ● ●


"NOW, MR. RUGGLESWORTH THIS IS IT... OUR NEW TRANSCONTINENTAL SUPER-WAY. WHAT DO YOU THINK OF HER?"
"ITS 817 MILES TO HOOTSVILLE INSTEAD OF 816 LIKE YOUR SIGN SAYS."

CONSTRUCTION OF DI

These pictures of the concrete foundation work clarification, we believe, how much the mechaniz shoveling and wheelbarrowing the concrete and co has been well justified.

All our concrete work is done under the supervis

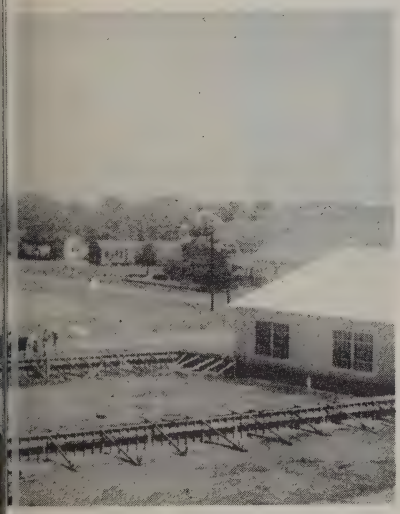
Palmer Massey,
Distri

TRICT 25 WAREHOUSE

our new District Warehouse show, without further
procedures have eliminated the laborious work of
te aggregates. The cost of building the bin, etc.,

of Downey Waltermire, Special Foreman.

rict Engineer



"THEY LIKE IT"

W.W. Potter, Assistant District Engineer
District 2

For years we more or less have taken for granted the maintenance knowledge and abilities of our employees who have kept our highways in such wonderful traveling condition at a very economical cost. Recently, however, we have realized that some of our employees are nearing retirement age, so we would like to recognize them for their years of loyal service and fine work. At a meeting of maintenance foremen on April 1, 1954, we photographed our maintenance foremen along with our District Engineer, and would like to present them to you. We believe that this may be some kind of record as the total length of service with the Highway Department for the ten members in this picture amounts to 251 years and 3 months as of April 1, 1954, for an average per individual of a fraction over 25 years.

These employees are, front row from left to right: Holly Renshaw, Senior Maintenance Foreman, 29 years, 3 months; J.R. Auvenshine, Senior Maintenance Foreman, 29 years, 8 months; W. W. Finley, District Engineer, 32 years, 2 months; A. H. Hillis, Senior Maintenance Foreman, 30 years, 3 months; J.C. Ferguson, Senior Maintenance Foreman, 27 years. Back row, same order: J. M. Rexroat, Senior Maintenance Foreman, 13 years, 4 months; W. C. Allen, Senior Maintenance Foreman, 25 years, 9 months; E.R. Stephens, Senior Maintenance Foreman, 26 years, 7 months; R.W. Haberzettle, Senior Maintenance Foreman, 24 years, 2 months; and E. C. Clay, Maintenance Foreman, 13 years, 1 month.

District 20's Approach to the

NEW EQUIPMENT RENTAL SYSTEM

M E M O R A N D U M

Beaumont, Texas
December 8, 1953

TO: ALL SUPERVISORS

FROM: E. D. Parmer

SUBJECT: STATE OWNED EQUIPMENT RENTAL

As most of you probably know, the equipment operation account is an account whereby equipment rental charged to projects, IPE's and maintenance accounts is accumulated and used to offset the expense of operating the equipment.

In past years, the rental rates charged have been set by the Austin Office and have been changed from time to time in an effort to make the equipment account remain more nearly in balance. These have been raised and lowered by classes of equipment on a District-wide basis without considering the operation cost of each individual unit.

Effective September 1, 1953, the setting of rental rates was made the responsibility of the Districts and a limit was set for the maximum allowable over-run and under-run in the equipment operation account.

In approaching the problem of setting these rates, we came to the conclusion that the most fair and practical method was to work out some means of making each unit pay its own way. In other words, to set the rate for each unit so that the rental earned by it would take care of its direct expense as well as its proportionate part of the indirect expense created by charges for shop and warehouse overhead.

As a starter, we calculated the cost of operation on each unit per mile or per hour for the twelve month period during the fiscal year ending on August 31, 1953. We found that indirect expense was 20% of the total expense and we included this percentage on each unit before we calculated the cost per mile or per hour. Attached is a list of all equipment presently in this District showing what each unit cost to operate during the past fiscal year. Also attached is an explanation of the way the equipment operation account works. The list of equipment shows the name of the supervisor to whom each unit is now assigned. In most cases, the same supervisor,had these units during the past fiscal year, but in a few cases, transfers have been made and the supervisor who now has the unit did not have it last year. The rates shown were calculated to the nearest cent on mileage equipment and to the nearest ten cents on hourly equipment. In other words, a unit operating at three and 4/10ths cent per mile and one operating at two and 5/10ths cent per mile are each shown as three cents. An Hourly unit at 3.84 per hour and one at 3.75 per hour are each shown as 3.80 per hour.

Since the rates shown on the attached list are actual rates based on the cost of operation and the number of miles or hours reported, over a twelve month's period, it seems fair and just to use these rates for the reporting of rental during this fiscal year. It is our plan to keep a record of expense and rental by individual

units and raise or lower rates by individual units periodically in an effort to keep the expense and rental as nearly even as possible. However, as a starter, and effective on November 21, 1953, we plan to use the attached rates. On new equipment we will use the base rate to the nearest even cent or to the nearest even ten cents as outlined above.

It is evident that some of these rates are high and some are low. We do not know the reason in either case, but apparently some of the hourly equipment is high because the units were used and incurred expense,,but no rental was reported.

Each of you is encouraged to study this tabulation since it may be that you should take certain steps to obtain more efficient operation of your equipment. Also you may be able to determine that you will be able to operate some of your units at a different rate than those shown. It is our thought that, since the rates used will be charged to money you must account for, and since each unit must pay its own way, you might want to recommend a lower or a higher rate for some units with reasons therefor. All such recommendations will be given due consideration if they are received in memorandum form and adjustments deemed proper will be made. Please bear in mind, however, that regardless of the rate used each unit must pay its own way, and adjustments in rates will be made in the future as needed to assure this.

Please remember that when our Equipment Rental Payroll is prepared on December 21, 1953 covering the period from November 21 through December 20, the rates as shown will be used unless recommendations for adjustments are received from you and are approved.

E.D.P.

Explanation of Equipment Operation Account:

Authorization 2:
All expense of operation of major equipment is to be charged to this authorization. Charges are to include depreciation, gasoline, oil, grease, and repairs. Fuel used for heating purposes is chargeable to the job on which the equipment is working and not to the equipment. Wire used in brooms on rotary sweepers and rewound broom cores are to be charged to the job and not to the equipment. Equipment or accessories built directly into and becoming a part of a unit of highway equipment shall be charged to the equipment as an accessory. This will include such minor items as seats for the transportation of laborers, tool boxes, safety features for asphalt distributor and such like accessories. All charges to this authorization are to be made by equipment numbers.

Authorization 10:
Charges to this authorization will include the following expense: Wages, expense and equipment rental of mechanics going to and from repair jobs in the field, expense of transporting equipment to and from the district shops for repairs, which includes equipment rental expense incurred in this connection as well as all wages and traveling expense of those employees engaged in such work. Equipment transferred within the district for the purpose of working and trips to the district office for supplies are not to be confused with equipment transferred for repairs even though some repairs might be made to the equipment while it is in the district shops. ONLY TRANSPORTATION EXPENSE CREATED BECAUSE OF REPAIRING EQUIPMENT IS TO BE CHARGED TO THIS AUTHORIZATION.

Authorization 11.
Charges to this authorization will include the following: Salaries, expense and equipment rental of the equipment supervisor, warehouseman, assistant warehouseman, watchman, and supervisory work of the shop foreman; the purchase price and maintenance cost of all shop tools, safety devices used on shop equipment, and other miscellaneous expense necessary in the shops and warehouse; and utility and telephone expense directly chargeable to the shops and warehouse.

Authorization 15:
Charges to this authorization are limited to depreciation of shop machinery. No other charges are made against this authorization.

Authorization 17:
No charges are to be made to this authorization. All rental earned through the use of State equipment is to be credited to it.

The theory of the equipment operation account is that the application of predetermined equipment rental rates accumulated in Authorization 17 will offset the cost of all direct charges against major equipment in Authorization 2, as well as the indirect costs reflected in Authorizations 10, 11, and 15. Naturally, there will always be a profit or loss at the end of each month or each fiscal year since the total equipment rental will never exactly offset the total cost of operation. The equipment operation account is never closed out, but profit or loss is carried over from month to month and from year to year.

TABULATION OF COST OF OPERATING INDIVIDUAL UNITS OF STATE OWNED EQUIPMENT IN DISTRICT 20 FOR THE FISCAL YEAR ENDING AUGUST 31, 1953

Explanation of Symbols used below:
C: This is a code number and is used only in the District Office and the Austin Office. It designates the particular class of equipment.
BR: This is a base rate which has been set by the Austin Office as a result of a study of operation costs of equipment on a State-wide basis.
DA: This is District 20's average cost of operation for the past fiscal year by classes.
(1) The numbers in parenthesis refer to notes on the last page.

Eq. No.	Hours or Mi.	Rate	Supervisor
Chevrolet Two Door Sedans:			
C 18-1	BR .045 Mi.	DA .060 Mi.	
56-H	7694	.06	Nagai
57-H	2145	.18	Young
58-H	2770	.07	Syphrett
59-H	627	.20	Young
120-F	23869	.04	Middleton
121-F	9848	.06	Young
122-F	28998	.05	Pool
123-F	19806	.05	Terry
139-F	11955	.09	Swain
140-F	8499	.10	Reagan
Plymouth Two Door Sedans:			
C 18-5	BR .044 Mi.	DA .064 Mi.	
184-E	10330	.06	Pool
Ford Two Door Sedans:			
C 18-7	BR .042 Mi.	DA .040 Mi.	
196-E	7845	.06	Parmer
Gasoline Maintainers - 69 HP or Less			
C 568-1	BR 1.80 Hr.	DA 1.77 Hr.	
Huber			
1226-A	549	3.80	Dixon
1227-A	508	3.90	Hoffpauir
Allis-Chalmers:			
1428-A	1575	1.80	Shaw
1429-A	1436	1.80	Glasscock
1459-A	1308	1.80	L. C. Cooper
1460-A	1299	1.50	Woosley
1505-A	1227	1.50	Norwood
1506-A	879	2.00	Dixon
1541-A	1060	1.20	Bilbo
1542-A	964	1.60	Crow
Trojan:			
1962	436	.90	Hoffpauir
1963	1026	.90	Shaw

Eq. No.	Hours or Mi.	Rate	Supervisor
Diesel Motor Graders - 69 HP or Less			
C 568-3	BR 2.50 Hr.	DA 3.81 Hr.	
Warco:			
1045-A	914	3.80	Hoffpauir
1058-A	1105	4.60	Hoffpauir
1116-A	1219	4.80	Norwood
1117-A	1240	2.80	Crow
1191-A	979	5.90	Jones
1209-A	961	7.30	Hoffpauir
1218-A	1033	4.40	Jones
1220-A	1187	2.70	Dixon
1864	1346	2.70	Glasscock
1866	1342	2.70	I.L. Cooper
1924	1146	2.90	L.C. Cooper
1952	1042	3.60	Hoffpauir
Adams:			
1946	1271	4.40	Woosley
Diesel Motor Graders - 70 to 99 HP			
C 568-5	BR 2.60 Hr.	DA 3.18 Hr.	
Adams:			
1067-A	1176	5.60	Hoffpauir
Austin-Western:			
1190-A	1142	4.00	Hoffpauir
Caterpillar:			
1383-A	1363	1.90	Shaw
1384-A	1269	2.00	Bilbo
Warco:			
1566-A	300	1.60	I.L.Cooper
Diesel Motor Graders - 100 HP & Over			
C 568-7	BR 3.30 Hr.	DA 3.94 Hr.	
Galion:			
1352-A	1000	6.80	Hoffpauir

Eq. No.	Hours or Mi.	Rate	Supervisor
Diesel Motor Graders - 100 H.P. & Over Cont.			
C 568-7 BR 3.30 Hr. DA 3.94 Hr.			
Caterpillar:			
1381-A	1278	2.30	Hoffpauir
1382-A	1049	3.20	Hoffpauir
1602-A	New (1)		Glasscock
Two Axle Pneumatic Roller			
C 731-2 BR .70 Hr. DA .43 Hr.			
Lewis-Browning:			
2003-C	348	.90	Hoffpauir
2004-C	323	1.00	Hoffpauir
Bros:			
2110-B	463	.50	Hoffpauir
2111-B	515	.10	Hoffpauir
2181	210	.10	Shaw
Ingram:			
2137-A	335	.10	Hoffpauir
Motor Road Roller - 5 to 8 Tons			
C 735-2 BR 2.30 Hr. DA 7.39 Hr.			
Timco:			
2012-B	240	7.50	Hoffpauir
Huber:			
2079-B	173	7.20	Hoffpauir
Motorized Wheeled Roller			
C 741 BR 1.60 Hr. DA .77 Hr.			
Littleford:			
2058-A	118	1.10	Bilbo
2059-B	252	.80	Glasscock
2060-B	198	1.10	Woosley
2061-B	154	.25	Crow
2062-B	325	.20	I.L.Cooper
2063-B	466	1.60	Shaw
2064-B	163	.40	L.C.Cooper
2065-B	184	.40	Norwood
Ferguson:			
2087-B	116	.10	Jones
Wheeled Roller			
C 738 BR .40 Hr. DA .12 Hr.			
Wheeled Roller Corp.			
2087	164 (2)	.10	Jones
2096	100	.50	Pool
2132	24 (2)	.10	Crow
Bros:			
2097-A	156	.10	I.L.Cooper

Eq. No.	Hours or Mi.	Rate	Supervisor
Sheepsfoot Rollers - 1 and 2 Drum			
C 737 BR .70 Hr. DA .41 Hr.			
Servis:			
2095-A	187	.10	Hoffpauir
2122-A	159	.10	Hoffpauir
2159-A	154	.30	Hoffpauir
Browning:			
2096-B	191	.10	Hoffpauir
2097-B	74	.10	Hoffpauir
Grace:			
2130-A	71	.20	Hoffpauir
2150-A	71	.10	Hoffpauir
2150-B	224	1.00	Hoffpauir
2151-B	232	1.00	Hoffpauir
Front End Loader - Less than 3/4 CY			
C 904-3 BR 2.30 Hr. DA 2.74 Hr.			
International ID-9:			
2681	297	2.00	Crow
Hough:			
2973	811	2.40	Shaw
2974	694	4.10	Jones
2975	810	2.20	Woosley
Front End Loader - 3/4 Cy and Over			
C 904-4 BR 3.00 Hr. DA 2.63 Hr.			
Hough:			
2923	1294	2.10	I.L.Cooper
2924	1078	2.90	L.C. Cooper
Tractomotive:			
2283-A	1031	1.90	Glasscock
International ID-9			
2728	479	4.80	Hoffpauir
2729	332	2.70	Hoffpauir
2730	278	2.40	Bilbo
2877	740	2.80	Norwood
Diesel Crawler Tractor - 40-60 HP			
C 900-4 BR 3.50 Hr. DA 13.24			
Allis-Chalmers:			
2784	318	13.20	Hoffpauir
Diesel Crawler Tractor - 60-80 HP			
C 900-5 BR 4.70 Hr. DA 1.96 Hr.			
Caterpillar:			
2556	310	2.00	Hoffpauir

Tabulation of Cost of Operating Equipment - Page 3

Eq. No.	Hours or Mi.	Rate	Supervisor
Diesel Crawler Tractor - Over 80 HP			
C 900-6 BR 5.50 Hr. DA 6.72 Hr.			
Allis-Chalmers:			
2573	105	2.60	Hoffpauir
2575	438	5.50	Hoffpauir
2594	163	6.40	Hoffpauir
2928	752	5.70	Hoffpauir
Caterpaillar:			
2626	324	7.60	Hoffpauir
International			
2762	740	7.20	Hoffpauir
2882	632	8.50	Hoffpauir
Gasoline Wheel Tractor - Under 40 HP			
C 898-1 BR 1.20 Hr. DA 1.89			
International:			
2822	541	1.90	Hoffpauir
Diesel Wheel Tractor - 40 HP & Over			
C 898-3 BR 2.50 Hr. DA 2.77 Hr.			
International:			
2724	595	2.80	Shaw
Station Wagons, Carryalls, Power Wagons			
C 915 BR .06 Mi.. DA .07 Mi.			
Chevrolet Carryall:			
3286-D	6858	.07	Young
3527-D	11831	.04	Swain
3528-D	13981	.05	Swain
3758-E	7692	.10	Terry
3759-E	8825	.09	Middleton
4198-E	679	.03	Middleton
4199-E	775	.02	Nagai
4200-E	262	.07	Young
4251-C	20585	.10	Swain
4316-D	16289	.09	Nagai
4317-D	15525	.07	Young
4318-D	18517	.05	Syphrett
4319-D	15446	.05	Suter
4320-D	10531	.06	Suter
4321-D	20034	.04	Terry
Dodge 1 Ton Power Wagon			
3653-C	4890	.16	Terry
Pickups (All Sizes)			
C 916-2 BR .048 Mi. DA .044 Mr.			
Dodge 1/2 Ton			
3145-D	19807	.04	Glasscock
3146-D	15988	.04	Fuller

Eq. No.	Hours or Mi.	Rate	Supervisor
Pickups (All Sizes) Continued			
C 916-2 BR .048 Mi. DA .044			
Dodge 1/2 Ton			
3147-D	20624	.05	Fuller
3148-D	18871	.02	Norwood
4211-D	11289	.06	Swain
4212-D	10771	.05	Middleton
4213-D	14541	.06	Young
4214-D	12552	.04	Hoffpauir
4215-D	20885	.04	Hoffpauir
4216-D	16306	.05	Swain
Chevrolet 1/2 Ton:			
3208-E	24828	.05	Dixon
3209-E	19488	.05	Nagai
3388-D	16385	.04	Suter
3389-D	20003	.04	Hoffpauir
3453-D	7646	.04	Middleton
3454-D	12222	.04	Swain
3455-D	12726	.05	Nagai
3456-D	10731	.03	Terry
3522-C	14590	.04	Suter
3523-C	11898	.06	Suter
3524-C	9657	.06	Terry
3529-D	12320	.09	Terry
3530-D	14605	.04	Middleton
3531-D	14653	.05	Nagai
3532-D	17595	.05	Fuller
3533-D	13199	.04	Swain
3534-D	21140	.03	L.C.Cooper
3535-D	18459	.06	Terry
3536-D	15041	.04	Young
3546-D	23919	.04	Hoffpauir
3547-D	33288	.04	Hoffpauir
3604-D	18142	.05	Syphrett
3605-D	19615	.02	Jones
3606-D	19232	.04	Suter
3607-D	12806	.04	Young
3608-D	12480	.04	Nagai
3609-D	23953	.04	Keith
3610-D	17191	.04	Pool
3611-D	7549	.07	Young
3612-D	9452	.05	Fuller
3821-E	10801	.06	Bilbo
3822-E	12135	.06	I.L.Cooper
3823-E	7291	.08	Crow
3824-E	10760	.06	Syphrett
3887-D	13993	.03	Middleton
3888-D	9188	.05	Nagai
3889-D	11030	.04	McCaughn
4241-C	5002	.06	Keith
4242-C	18493	.03	Young

Eq. No.	Hours or Mi.	Rate	Supervisor
Pickups (All Sizes) Continued			
C 916-2	BR .048 Mi.	DA .044	
Chevrolet 1/2 Ton: (Continued)			
4243-C	11144	.04	Swain
4244-C	12909	.06	Swain
4245-C	12958	.08	Fuller
4246-C	31763	.02	Shaw
4247-C	14308	.08	Terry
4248-C	18645	.03	Woosley
4250-C	7361	.06	Young
4253-C	16636	.04	Young
4254-C	14106	.04	Suter
4802-C	14591	.04	Hoffpauir
4803-C	10250	.07	Hoffpauir
International 1/2 Ton:			
4086-D	31264	.08	Hoffpauir
Ford 1/2 Ton:			
4309-D	40758	.04	Hoffpauir
4310-D	27663	.05	Hoffpauir
Chevrolet 1 Ton:			
3816-D	28382	.05	Hoffpauir
3817-D	28884	.04	Hoffpauir
3820-E	7979	.09	Fuller
4080-C	16504	.05	Fuller
International 1 Ton:			
4076-D	30235	.05	Keith
4142-D	24525	.05	Keith
4143-D	20722	.07	Keith
Dodge 1 Ton:			
4217-D	17021	.06	Syphrett
4504-D	20608	.07	Bilbo
4505-D	5836	.28	Reagan (Lab.)
Chevrolet Coupe Pickup:			
3735-D	33031	.02	Bilbo
3736-D	30762	.02	Crow
3794-E	20916	.04	Glasscock
3795-E	12450	.05	Dixon
3796-E	16668	.04	Woosley
3797-E	25792	.03	Shaw
3965-D	33581	.03	I.L.Cooper
3966-D	32213	.03	L.C.Cooper

Eq. No.	Hours or Mi.	Rate	Supervisor
Pickups (All Sizes) Continued			
C 916-2	BR .048 Mi.	DA .044	
Plymouth Coupe Pickups:			
4186-D	36118	.04	Hoffpauir
4187-D	35836	.03	Hoffpuair
4188-D	31628	.03	Keith
4190-D	49229	.03	Jones
4191-D	40280	.03	Norwood
1 1/2 Ton Dodge Trucks			
C 929-6	BR .10 Mi.	DA .07	
3923-C	16765	.07	Bilbo
3924-C	20650	.06	Woosley
4658-C	12340	.08	Glasscock
4662-C	13893	.09	Crow
4664-C	19136	.09	I.L.Cooper
4666-C	26993	.04	Jones
2 Ton Ford Trucks			
C 930-1	BR .084 Mi.	DA .086	
3677-D	20375	.13	Hoffpauir
3678-D	28001	.09	Hoffpauir
3679-D	26573	.09	Hoffpauir
3680-D	26479	.11	Hoffpauir
3681-D	17415	.12	Norwood
3682-D	28592	.07	Hoffpauir
4331-C	21156	.07	Norwood
4366-C	23526	.06	Norwood
4367-C	21117	.07	Norwood
4368-C	17033	.05	Glasscock
4369-C	13388	.08	Glasscock
2 Ton Chevrolet Trucks			
C 930-2	BR .08 Mi.	DA .076	
3490-E	16657	.07	L.C.Cooper
3491-E	22949	.06	I.L.Cooper
3492-E	16628	.07	Jones
3493-E	19313	.07	Norwood
3735-C	15740	.05	Norwood
3737-C	23902	.07	L.C.Cooper
3848-D	16868	.11	Crow
3849-D	12652	.14	Bilbo
3943-D	8820	.19	Hoffpauir
3943-E	7846	.04	L.C.Cooper
3944-E	7318	.07	Shaw
3945-E	3044	.14	Woosley
3946-E	7779	.06	Dixon

Eq. No.	Hours Or Mi.	Rate	Supervisor
2 Ton Chevrolet Trucks (Continued)			
C 930-2	BR .08 Mi.	DA .076	
3947-E	7058	.07	Shaw
3948-E	3922	.11	Fuller
3949-E	7117	.07	Dixon
3950-E	4907	.11	Pool
4048-D	19384	.08	Hoffpauir
4256-C	21656	.06	I.L.Cooper
4257-C	22621	.07	Dixon
4258-C	13878	.08	Shaw
4285-D	23750	.09	Dixon
4286-D	13640	.09	I.L.Cooper
4287-D	15798	.09	Shaw
4288-D	24682	.10	Norwood
4289-D	18000	.09	Glasscock
4290-D	26073	.07	L.C.Cooper
4291-D	19180	.10	Jones
4292-D	23497	.07	Crow
4835-C	13702	.07	Bilbo
4836-C	12125	.07	Bilbo
2 Ton International Trucks			
C 930-3	BR .09 Mi.	DA .085	
3964-D	21801	.08	Jones
2 Ton Dodge Trucks			
C 930-4	BR .091 Mi.	DA .078	
3138-D	18683	.09	Jones
3139-D	27717	.07	Bilbo
4007-C	19359	.09	Bilbo
4008-C	19865	.06	Shaw
4296-E	New (1)		Glasscock
4297-E	New (1)		I.L.Cooper
4298-E	New (1)		Fuller
4299-E	New (1)		Glasscock
4300-E	New (1)		Norwood
4301-E	New (1)		Norwood
4302-E	New (1)		Shaw
4304-E	New (1)		Bilbo
4305-E	New (1)		L.C.Cooper
4509-D	24035	.10	Hoffpauir
4510-D	21593	.09	Woosley
4511-D	24845	.08	Woosley
4657-C	21008	.07	L.C.Cooper
4661-C	10204	.08	Bilbo
4663-C	22738	.12	I.L.Cooper
4665-C	12558	.04	L.C.Cooper
4303-E	New (1)		Hoffpauir

Eq. No.	Hours or Mi.	Rate	Supervisor
Trucks - Over 2 Ton Less than 5 Ton			
C 931	BR .18 Mi.	DA .194 Mi.	
2 1/2 Ton Int'l. Flat Bed:			
4171-D	25021	.19	Keith
4172-D	19237	.23	Keith
3 Ton Dodge Flat Bed:			
3455-B	10682	.10	Keith
4 Ton Diamond T Flat Bed:			
4523-D	17114	.21	Hoffpauir
4 Ton Diamond T Truck-Tractor:			
4524-D	14118	.21	Hoffpauir
Trucks - 5 Ton & Over			
C 935	BR .20 Mi.	DA .199 Mi.	
Int'l. 5 Ton Truck-Tractor			
3393-D	12093	.20	Hoffpauir
Small Core Drill on Truck			
C 181-2	BR 3.00 Hr.	DA 7.05 Hr.	
Marmon-Harrington:			
5002-A	65	7.00	Reagan
Asphalt Distributor - 800 Gal. & Over			
C 10-2	BR 2.10 Hr.	DA.1.72	
Roscoe:			
10827-B	1266	1.70	Hoffpauir
Asphalt Distributor - 800 Gal. & Over - Truck Mounted			
C 11-2	BR 3.80 Hr.	DA 3.94	
Roscoe:			
5115	656	3.80	Hoffpauir
Air Compressor 165 CF & Lower			
C 6-1	BR 1.30 Hr.	DA 2.56	
Le Roi:			
6073	332	1.00	Pool
Worthington:			
6088	297	4.30	Hoffpauir
Air Compressor - Approx. 210 CF			
C 6-2	BR 2.20 Hr.	DA 1.63 Hr.	
Schramm:			
6014-A	667	1.60	Fuller

Eq. No.	Hours or Mi.	Rate	Supervisor
Air Compressor - Approx 210 CF (Cont'd.)			
C 6-2 BR 2.20 Hr. DA 1.63 Hr.			
Jaeger:			
6063-A	New (1)		Pool
8 Ft. Machine Drawn Grader			
C 326-1 BR .25 Hr. DA 3.28 Hr.			
Adams:			
6495	See Note (3)		Crow
Northfield:			
7047	3	3.30	Hoffpauir
12 Ft. Machine Drawn Grader			
C 326-3 BR .50 Hr. DA .00			
Galion:			
6960	See Note (3)		Glasscock
Adams:			
7006	See Note (4)		Glasscock
12 Ft. Power Control Machine Drawn Grader			
C 326-4 BR 2.00 Hr. DA 4.16 Hr.			
Adams:			
7075	437	4.20	Hoffpauir
Truck Drawn Grader			
C 327 BR .30 Hr. DA .06 Hr.			
Stockland:			
7025	174	.10	Norwood
Asphalt Mixers			
C 12 BR 3.00 Hr. DA 1.32 Hr.			
Blystone:			
8113-A	80	.40	Dixon
8114-A	99	1.30	Norwood
8245	52	.20	I.L.Cooper
8284	59	4.00	Bilbo
Concrete Mixers			
C 615 BR 1.40 Hr. DA 2.20 Hr.			
Koehring:			
8115-A	241	2.80	Pool
Jaeger:			
8167-A	141	1.10	Hoffpauir

Eq. No.	Hours or Mi.	Rate	Supervisor
Road Sweepers			
C 734 BR 1.80 Hr. DA 1.63			
Grace:			
8304-A	14	12.80	Glasscock
8319-A	25	1.70	Pool
8331-B	240	.80	Jones
8332-B	253	1.00	Hoffpauir
8333-B	244	.70	Hoffpauir
8359-A	52	.30	Shaw
8360-A	80	.20	Norwood
8361-A	47	.40	Dixon
8379-A	71	4.00	Pool
8380-A	40	10.00	Hoffpauir
Asphalt Heaters			
C 9-2 BR 1.10 Hr. DA 1.26 Hr.			
Grace:			
8410-B	692	2.10	Pool
Standard:			
8427-A	48	1.00	Norwood
Roscoe:			
8482-A	119	.70	Bilbo
8684-A	355	.90	Pool
8685-A	457	.70	Pool
Triplex:			
8496-A	84 (2)	.10	Dixon
Circulating Tank Car Heater			
C 14-2 BR 2.40 Hr. DA 2.33 Hr.			
Grace:			
8544-A	745	2.20	Hoffpauir
Bros:			
8641-A	758	2.40	Hoffpauir
Asphalt Crack Sealer			
C 8 BR .50 Hr. DA 1.39 Hr.			
Roscoe:			
8664-A	33	2.00	Shaw
8665-A	19	.30	Shaw
Duggan's:			
10806-A	See Note (4)		Fuller

Eq. No.	Hours or Mi.	Rate	Supervisor
Small Portable Rock Crusher			
C 192-1 BR 2.50 Hr. DA .00			
War Surplus:			
9226	See Note (4)		Pool
Scrapers - 5 Yards & Over			
C 761 BR 1.80 Hr. DA .97 Hr.			
Heil:			
9354	See Note (3)		Pool
International:			
9399	171	1.00	Hoffpauir
Portable Pump & Engine			
C 722 BR .50 Hr. DA 1.24			
Wisconsin:			
9721-E	98	.90	Norwood
9723-D	235	1.00	Hoffpauir
9724-D	206	.20	Pool
Gormann-Rupp:			
9750-C	335	.80	L.C.Cooper
9751-C	107	.50	I.L.Cooper
9752-C	93	3.70	Shaw
Sterling:			
9768-B	289	1.20	Hoffpauir
9769-B	424	1.20	Hoffpauir
9770-B	165	2.30	Hoffpauir
9771-B	379	.40	Hoffpauir
Shop Built:			
9789-D	83	5.20	Hoffpauir
Marlow:			
9799-C	123	2.50	Hoffpauir
1-1/2, 2 and 3 Ton Trailers			
C 906 BR .30 Hr. DA .24 Hr.			
9813-A	25 (2)	.10	Keith
9814-A	14 (2)	.10	I.L.Cooper
9879-C	40 (2)	.10	Hoffpauir
9899	124	.40	Hoffpauir
Trailers - 10 Ton Less than 15 Ton			
C 908 BR 1.00 Hr. DA .00			
12 Ton Platform:			
9832-A	17 (2)	.10	Hoffpauir
Trailers - 15 Tons & Over			
C 909 BR 1.50 DA .78			
Low Boy Trailers:			
9889-A	529	1.00	Keith

Eq. No.	Hours or Mi.	Rate	Supervisor
Trailer - 15 Ton & Over (Cont'd.)			
C 909 BR 1.50 DA .78			
Float Trailers:			
9911-A	1005	.70	Keith
5 Ton Trailers			
C 907 BR .80 DA .52			
Tank Trailers:			
9924-A	672	.20	Hoffpauir
9925-A	434	1.00	Hoffpauir
1-1/2 to 3 Ton Tank Trailers			
C 905-2 BR .60 Hr. DA .50 Hr.			
9946-A	668	.50	Hoffpauir
Small Power Mowers			
C 620 BR 1.20 Hr. DA 1.49 Hr.			
Toro:			
10046-B	48	.30	Dixon
10047-B	177	.80	Woosley
10048-B	122	.70	Glasscock
10049-B	See Note (4)		Pool
10050-B	28	3.50	L.C.Cooper
10051-B	18	4.30	Bilbo
10052-B	5	8.90	Pool
Jari:			
10138-B	106	.90	Norwood
10894-A	45	2.70	Crow
Trailer Mower - Rotary Cutter			
C 621-2 BR .70 Hr. DA .72 Hr.			
Lilliston Roto Speed:			
10060-C	442	.70	Shaw
10061-C	452	.70	Shaw
Trailer Mower - Reel Type			
C 621 BR 1.00 Hr. DA .23 Hr.			
Worthington:			
10084-B	286	.20	Shaw
Tractor Mowers			
C 624 BR 1.30 Hr. DA 1.70 Hr.			
Case:			
10121-B	340	2.20	Crow
10122-B	938	.80	Shaw
10123-B	388	2.20	Shaw
10139-B	203	3.10	Shaw
International:			
10207-A	211	3.50	I.L.Cooper
10208-A	677	1.40	Shaw

Eq. No.	Hours or Mi.	Rate	Supervisor
Power Shovel & Dragline 3/4 Cy & Over			
C 716 BR 6.10 Hr. DA 6.69			
Unit Truck Mounted:			
10321-A	343	5.20	Hoffpauir
Unit Crawler Type:			
10368	827	7.30	Hoffpauir
Power Shovel or Dragline 1/2 or 5/8 Cy			
C 715-2 BR 4.80 Hr. DA 5.96 Hr.			
Osgood Crawler 1/2 Cy			
10337	811	5.60	Hoffpauir
Insley Crawler - 1/2 Cy			
10329	1145	6.20	Fuller
Pile Drivers			
C 680 BR 2.50 DA 2.16			
10406	65	2.20	Pool
Small Motorized Paint Stripe Machine			
C 650-1 BR 1.10 Hr. DA 1.87 Hr.			
Kelly-Creswell:			
10502-A	103	1.00	Norwood
10571	6	16.40	Pool
Large Motorized Paint Stripe Machine			
C 650-4 BR 3.00 Hr. DA 5.06			
Meili-Blumberg:			
10514-A	469	5.10	Fuller
Paint Stripe Machine - Non Motor			
C 651 BR .50 Hr. DA .16 Hr.			
Shop Built			
10566	100	.20	Hoffpauir
Road Building Machine			
C 733 BR 20.00 Hr. DA 60.00 Hr.			
Flynn:			
10712-B	48	60.00	Hoffpauir
Wheel Mounted Scarifier			
C 756 BR 3.30 Hr. DA .00 Hr.			
Wes-Tex			
10717	See Note (3)		Hoffpauir
Slusser-McLean:			
10918-A	See Note (3)		Glasscock
Earth Mover - Truck Mounted			
C 272 BR 3.90 Hr. DA 4.09			
Gradall			
10738-B	1753	4.00	Fuller

Eq. No.	Hours or Mi.	Rate	Supervisor
Cabin Boat			
C 54 BR 1.70 Hr. DA 9.41 Hr.			
21 Ft. Inboard Motor:			
10741-B	50	9.40	Syphrett
Trailer Type Spreader Box			
C 792 BR 1.50 Hr. DA 3.34			
Burch:			
10781-A	149	4.00	Hoffpauir
10945-A	139	2.60	Hoffpauir
Concrete Joint Cleaning Machine			
C 380 BR 1.00 Hr. DA .81 Hr.			
Tennant:			
10861-B	489	.80	Pool
Gasoline Power Saw Rig			
C 750 BR .50 Hr. DA .00			
Jacques:			
10925-A	See Note (4)		Pool
Heavy Duty Disc Harrow			
C 227 BR 1.00 Hr. DA .40 Hr.			
Towner:			
10952-A	215	.40	Hoffpauir
10953-A	19	1.00	Jones
10954-A	16	.20	Hoffpauir

NOTE (1) New Units - No Rental or Expense Last Year - Use Base Rate.

NOTE (2) No Expense Last Year.

NOTE (3) No Expense or Rental Last Year. Use Base Rate.

NOTE (4) Expense charged, but no Rental. Use Base Rate.

Arithmetic-

E.D. Parmer, Assistant District Engineer
District 20

At our last Resident Engineer's meeting in District 20, there was some discussion about what it takes to secure a good road. A few days later, W.E. Suter, Senior Resident Engineer at Jasper, sent in the following memorandum:

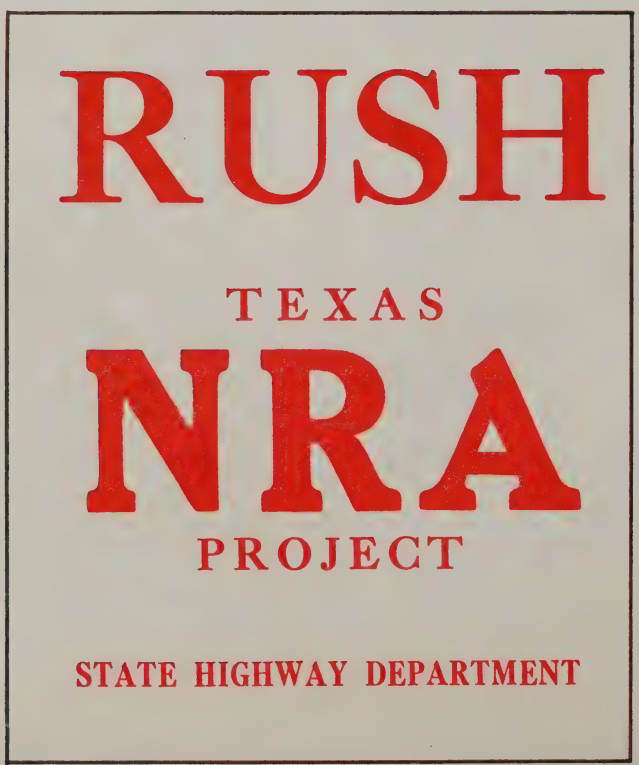
Subject: Highway Engineer's Problem

ARITHMETIC OF THE HIGHWAY

	DIMENSIONS		DESIGN	
PROPER	QUALITY	PRODUCT OF	MATERIALS	ADDS UP TO A GOOD ROAD
	SUPERVISION		INSPECTION	

● ● ●

"How many of you remember these days?"



Highway Signs Go to School

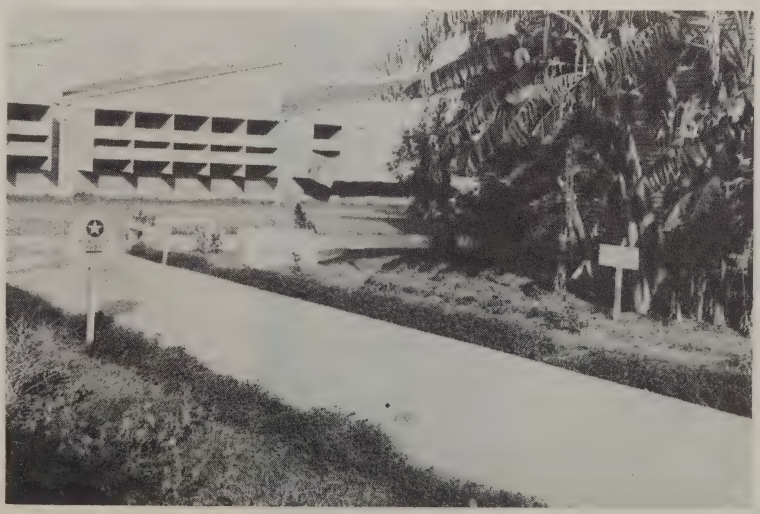
J.F. Snyder, District Engineer
District 21

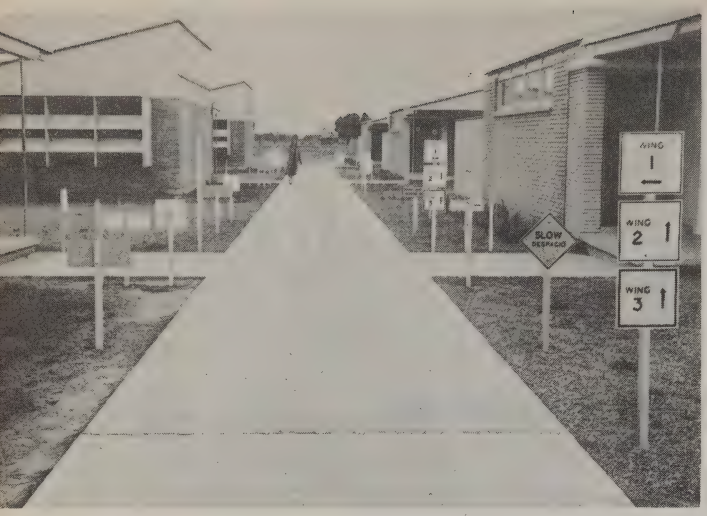
On several occasions in the past, this district has furnished used and reconditioned highway markers and warning signs to the high schools for use in the Drivers' Instruction Classes and has helped in every way possible to make these classes a success.

A new grade school opened this year in North Pharr for the first four grades where the student body is mostly children of Latin-American descent. Mrs. Gertie M. Napper, principal of the school, inquired if it would be possible for the Highway Department to furnish some highway signs for instruction purposes.

It was our thought that, possibly, the lower grades might be a more fertile place for highway use instruction, particularly, when the student body is predominantly Latin American. The arrangement of the buildings and walks lends itself readily to marking and signing as a highway. The walks were marked for 2-, 3-, and 4-lane highways with the standard markings and signing using miniature signs and supports. Attached are pictures showing the results of our efforts.

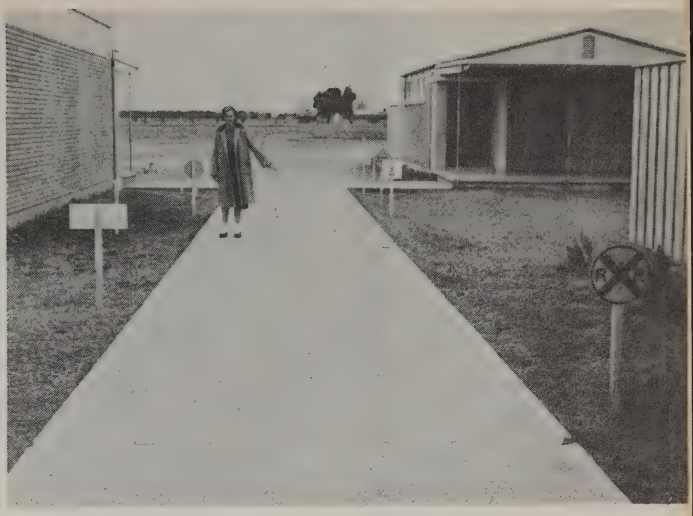
The school authorities are most pleased with this project and feel that instruction in the lower grades might be more productive than in the high schools. This office is quite pleased with the results and the efforts Mrs. Napper and her teaching staff are putting forth to make this project a success. The children seem to cooperate readily, and we feel that a great deal of good will be realized from this project.

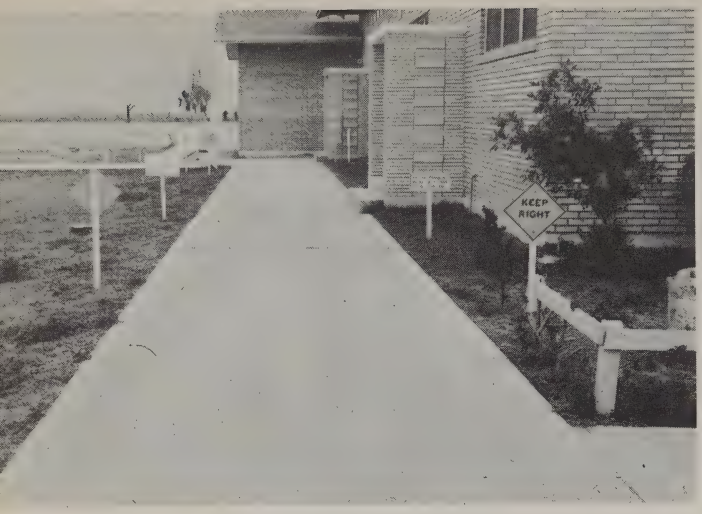


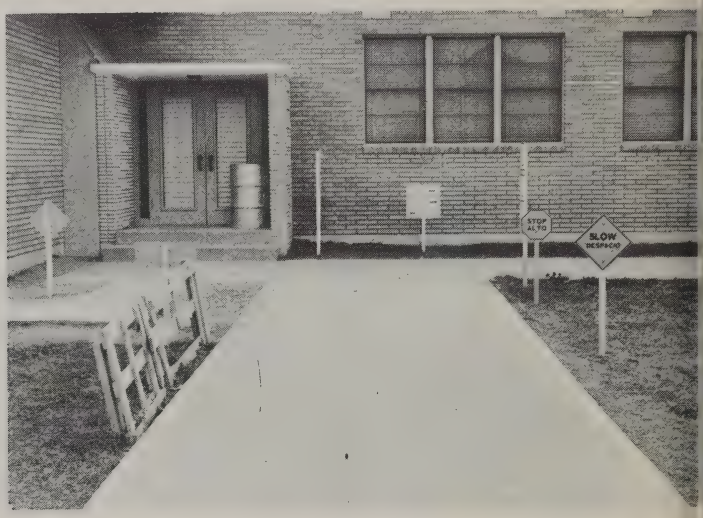

WING
1
WING
2 1
WING
3 1
SLOW
DESPACIO

WING
1

WING
1
WING
2 1
WING
3 1




KEEP
RIGHT


STOP
AL TO
SLOW
DESPACIO

DO NOT CROSS
DOUBLE STRIPE

PERSONNEL CHANGES

H.L. Arno, Director of Personnel

Dallas Urban Project, Dallas

To Road Design Division, headquartered in Dallas: R. E. Killmer from Engineer-Manager to Principal Engineer Consultant on modified service May 1, 1954.

To District 18, Expressway, Dallas: Oliver G. Rayner changed from Supervising Urban Engineer to Expressway Engineer April 2, 1954.

Houston Urban Project, Houston

Joe M. Battle changed from Senior Designing Engineer to Supervising Designing Engineer April 1, 1954.

Aid Division, Austin

Carl E. Clinger, Senior Contracts Estimate Engineer, accepted retirement April 30, 1954.

Highway Planning Survey Division, Austin

To Aid Division, Austin: Burney F. Stinson changed from Office Engineer to Senior Contracts Estimate Engineer April 16, 1954.

Maintenance Division, Austin

To Land Service Roads Division, Austin: P. S. Bailey changed from Maintenance Engineer to Engineer, Land Service Roads, March 1, 1954.

ACCIDENTS REPORTED FOR MARCH

Equipment and Procurement Division

Total amount of damage is from September 1, 1953, up to date and is to both State-owned equipment and that owned by individuals involved in accidents.

District 1	8 Accidents	$1,132.50
District 2	4 Accidents	1,147.00
District 3	4 Accidents	1,460.00
District 4	6 Accidents	1,286.01
District 5	5 Accidents	515.00
District 6	2 Accidents	195.00
District 7	3 Accidents	360.00
District 8	6 Accidents	630.00
District 9	1 Accident	535.00
District 10	3 Accidents	178.13
District 11	1 Accident	250.00
District 12	15 Accidents	2,885.00
District 13	5 Accidents	1,821.93
District 14	7 Accidents	674.00
District 15	3 Accidents	115.00
District 16	4 Accidents	1,525.00
District 17	3 Accidents	190.00
District 18	12 Accidents	1,622.00
District 19	3 Accidents	414.50
District 20	6 Accidents	3,081.00
District 21	7 Accidents	1,850.00
District 22	2 Accidents	800.00
District 23	1-	300.00
District 24	1 Accident	110.00
District 25	3 Accidents	166.00
Camp Hubbard	--	--

. . . Please have routes marked north or south. We would go in the wrong direction sometimes and have to return over the same route.

Clawson, Michigan

. . . We regretted that we couldn't take an oil well home with us. . .

Mr. & Mrs. Alfred Willardson
Spirit Lake, Iowa

. . . We didn't recognize all the wild flowers and think it would be nice to have an identification pamphlet. . .

Oakland, California

. . . I have always heard the heart of a Texan was as big as the state. I agree after being stranded in Longview for four days with a child in the hospital. . .

Mr. & Mrs. Ira C. Duncan
Birmingham, Alabama

. . . Yesterday I drove from Texarkana to Mount Pleasant and returned by Atlanta.

Of course I knew the roads to be excellent from past experience. What was far more noticeable was the neat condition of the right of way. The right of way along the whole route was "neat as a pin," as was also from Marshall to Shreveport, a trip I made a few days ago.

I congratulate you!

R. T. Douglas
Gilliam, Louisiana

. . . Just a suggestion — You might have a highway information station in the Rio Grande Valley to aid winter visitors on their return trips. . .

Palo, Iowa

. . . No warning of turns of route until you reach the turnoff . . .

Brooklyn, New York

. . . Every minute spent in Texas has been a pleasure long to be remembered. Never change anything. I like it all.

Howard Rosseter
Albany, Ohio

. . . We like Stetsons, but why keep them on indoors? In the presence of ladies, too! Tsk! Tsk!

Chicago, Illinois

. . . We liked the courtesy at your information bureaus and your fine roads, also the effort you take in keeping your highways clean.

H. R. Wolfurberger
Modesto, California

. . . Your highways are a real credit to your state in view of the long distances through unsettled country.

P. D. Martin
Montreal, Canada

. . . They need a four-lane divided highway between Houston and Beaumont and east. . .

G. F. Abele
Hampton, Virginia

. . . Good highways. We compliment you for your roadside parks and your tourist information bureaus. We found Texans very courteous to tourists.

St. Louis, Missouri

. . . Your roads are very good. Please send me one. . .

J. A. McGinty
Indianapolis, Indiana

. . . Now here's what we didn't like about Texas . . . Relatives.

Chicago, Illinois

IN MEMORIAM

Robert A. Kennedy Jr., a welding inspector on the Bennington Street Overpass project in Houston, was instantly killed on March 29 when a 50-foot I-beam weighing five tons overturned as he and a contractor's employee were grading the beam.

Charles R. Calcote, skilled laborer in District 10, was struck by a dump truck on April 22, and died the same day. Calcote was supervising patching operations and the dump truck backed into him.